

# **Trash Burning in Iowa**

**Trash Burn Workgroup  
October 12, 2006**

# Trash burning – *What is it?*



**Trash burning = Burning of residential waste in the open air (e.g. burning on the ground or in a burn barrel)**



**Residential waste = “Refuse” generated on the premises as a result of residential activities.**



# Residential waste does not include:

- Tires
- Trade wastes
- Garbage (animal & veg food products)
- Recyclable goods & plastics (more on this later).





# Residential Trash Burning

## Challenge:

- Can we reduce trash burning in Iowa, and should we?
- What is the best way to accomplish this?



# Objectives

- Identify reasons for trash burning
- Recognize how trash burning pollutes the air
- Review state rules for trash burning
- Discuss health impacts of trash burning

# Objectives – con't

- Improve understanding of safety & liability issues.
- Review past education and outreach efforts
- Iowa Trash Burning Survey - Results and findings
- Consider the connection – trash burning, waste disposal and recycling



# Reasons for Trash Burning

- Habit
- Convenience
- Economics – Cost of landfilling or recycling.
- Perception that pollution, if any, is “gone with the wind.”



# Air Awareness

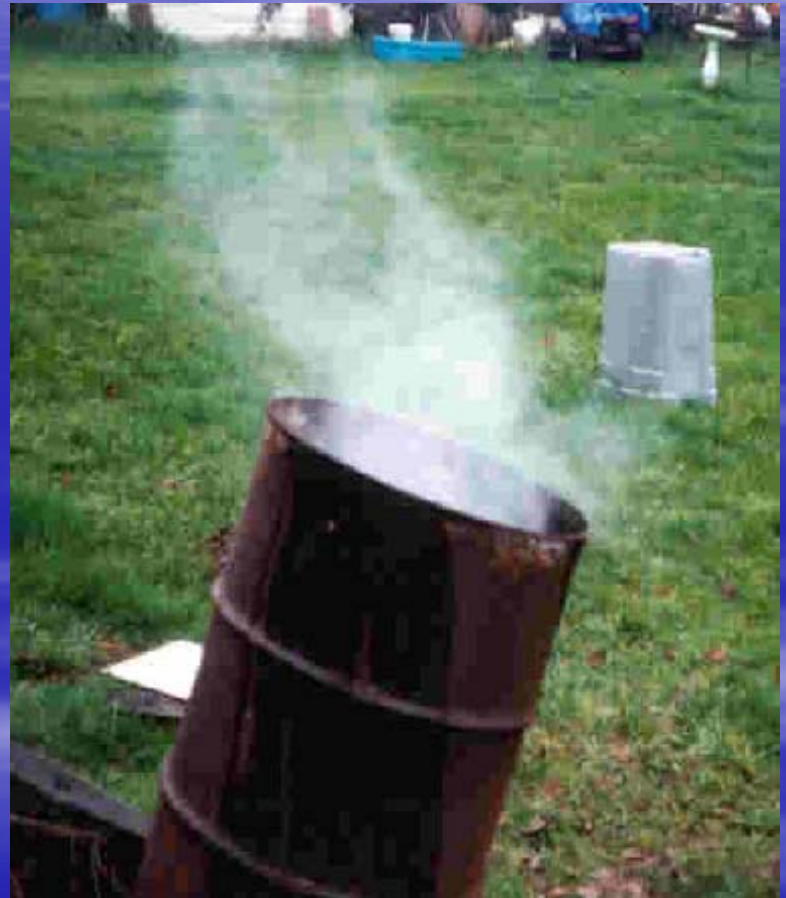
- Most people take air for granted
- Air is a substance that we consume every day – 1 gallon water v. 3800 gallons air
- Can survive 2-3 days without water, but only 15 minutes without air.

# How Is Iowa's Air Quality?

- Most days good to moderate air
- Unhealthy air in Iowa every year--mainly particulate matter and ozone smog (e.g. Feb. 1<sup>st</sup> – 3<sup>rd</sup>, 2005)

# Smoke – What is it?

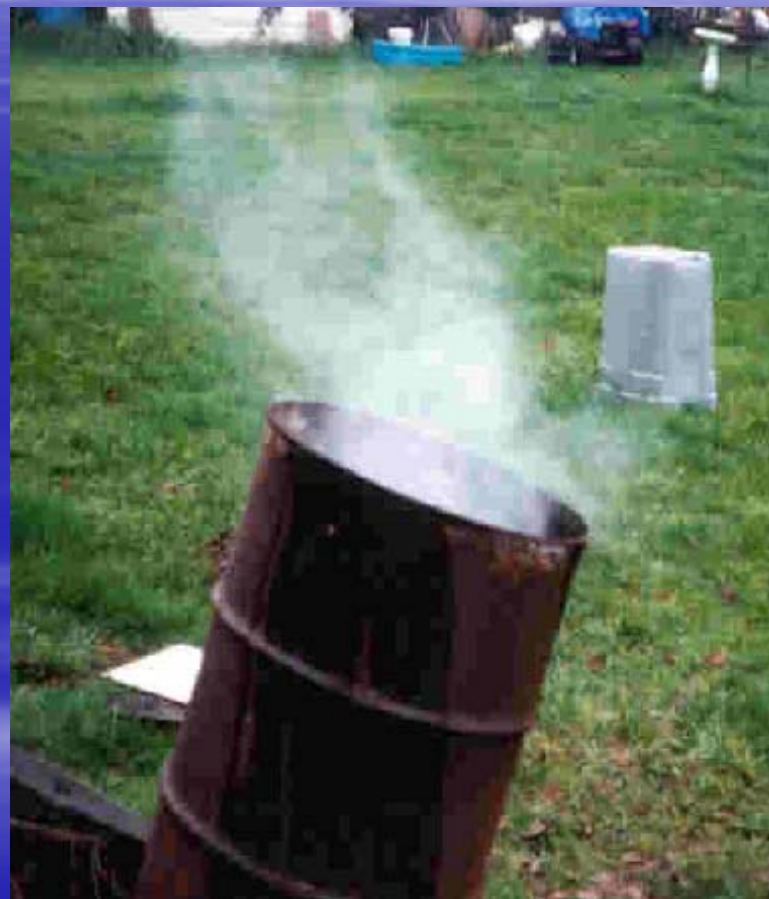
- Soot, tar, and ash are the solid “bits” of particles you can often see formed from chemical reactions in the plume or remnant of flaming combustion.
- Vapors and gases are formed during incomplete combustion and generally cannot be seen.





# Smoke – What is it?

- **Soot, tar, and ash**  
= air pollution =  
particulate (PM) &  
some air toxics
- **Vapors and gases**  
= air pollution =  
carbon monoxide  
(CO), hydrocarbons  
(VOC), sulfur  
dioxide (SO<sub>2</sub>) and  
Nitrogen (NO<sub>x</sub>) & air  
toxics

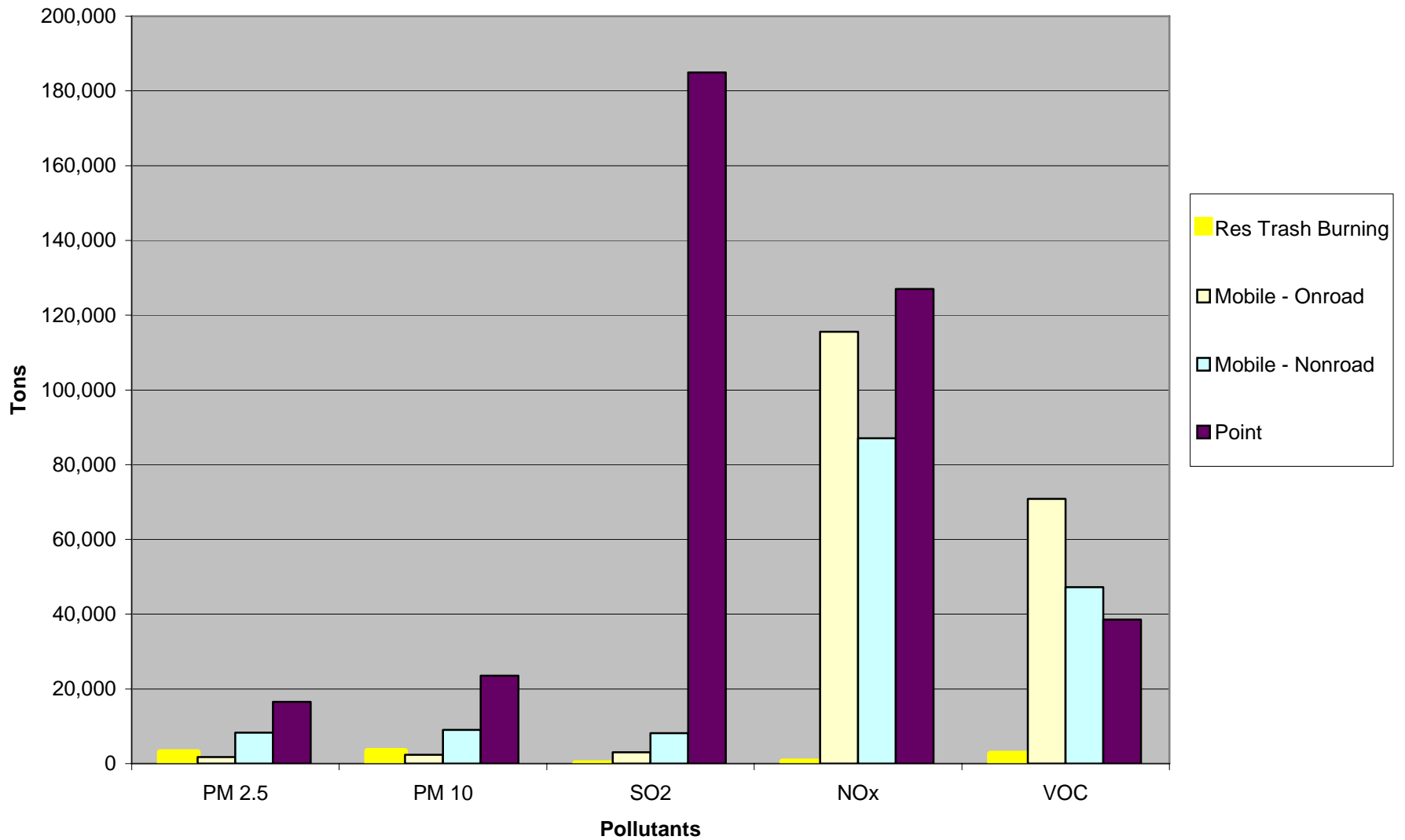




**How does air pollution  
from trash burning  
compare to other sources  
of air pollution (i.e.  
industry, cars etc.)?**

We can then compare the  
“criteria” pollutants emitted at  
these sources. “Criteria”  
pollutants are those for which  
EPA has set health standards.

## Emissions Comparison - 2002



# If trash burning pollution is so much less than other pollution, why do we care?

- Trash burning occurs at ground level.
- Trash burning may occur under poor conditions, such as inversion (cold air is trapped under warm air = no dispersion of air pollutants).
- Trash burning often occurs within residential neighborhoods.
- Trash burning occurs at thousands of locations throughout the state.
- All these factors combine to potentially expose the public to harmful levels of air pollutants.

# Smoke

We have known for many years that it causes:

- Watery Eyes
- Irritated Respiratory Tract
- Reduced Lung Function
- Increased Hospital Visits





# Iowa Open Burning Regulations

- Have recognized for more than 30 years that open burning causes air pollution.
- Regulations generally ban open burning [567 Iowa Administrative Code (IAC) 23.2].
- Several exceptions, including an exception to allow burning of residential waste.
- Alternative such as recycling and trash pick-up not as widely available in the past.

# Open Burning Regulations

- Burning of “locally recyclable goods or plastics” is not allowed
  - Added to state rules in mid-1990’s
  - Not well understood
- Trash burning is banned in greater Des Moines, Cedar Rapids and Council Bluffs in the 1970’s to meet the PM standard.
- Trash burning has been banned in Polk County since 1983.

# Open Burning Regulations

- **Why now?** – Growing evidence on the health risks from open burning.
- **Trash has changed!** – More plastics and synthetic materials containing chlorine & other toxins.
- **Disposal options** – More alternatives to burning are now available.

# Open Burning Regulations

- **New federal regulations** – Need to consider open burning impacts in our implementation of the new standard for fine particulate (EPA finalized in September 2006).
- **State rules could use a makeover!**
  - Many of the terms used are 20-30 years old and are no longer as commonly used
  - Rules are in two different locations [Ch. 20 (definitions) & Ch. 23]
  - The rules are not easy to follow or to understand

# Smoke

- Particulate matter (PM) is the pollutant of most concern
- Microscopic soot particles 2.5 microns in size (PM<sub>2.5</sub>) the most harmful.
- About the thickness of a human red blood cell
- Remain airborne for several weeks
- Dense concentrations visible as smoke or haze





**Fine  
Particle  
< 2.5 microns**

**Flour**

**Beach Sand**

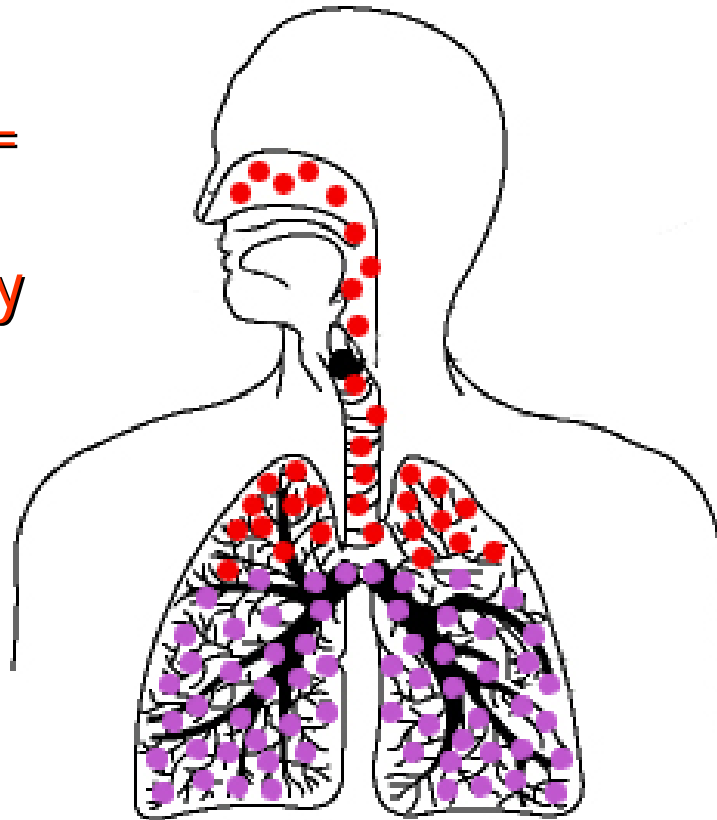
# Particulate Health Effects\*

- Exposure increases hospitalization and emergency room visits
- Causes thousands of premature deaths annually in United States
- Can aggravate heart & lung diseases
- Asthmatic children exposed to high particulate pollution levels much more likely to develop bronchitis
- PM standards revised several times to adequately protect public health (most recently in September 2006). Many consider even the new standard to be inadequate

*\*Source – U.S. EPA: More information available at <http://www.epa.gov/oar/particlepollution/>*

# Respirable Particulates

Coarse  
particles =  
upper  
respiratory  
system



Fine  
particles =  
lower  
respiratory  
system

# Groups at Greater Risk

- Athletes & active adults
- Outdoor workers
- The elderly
- Those with respiratory illnesses like asthma or those with heart disease
- Children

# Air & Children

- Developing lungs and organs more susceptible to pollution
- Breathe more air per pound of body weight than adults
- Outdoors more – breathing larger volumes of air
- Asthma - The most common chronic disease for children



# Asthma

- Unknown medical cause, but smoke is a known trigger for an asthma attack. A severe asthma attack, if not treated immediately, can result in death.

# Iowa Asthma Epidemic\*

- Dramatic increase over last 10 years
- Iowa annual asthma:
  - 12,000 hospitalizations;
  - 40,000-50,000 ER visits;
  - 35,000-45,000 unscheduled office visits
- 200,000 Iowans with asthma (50,000 under age 18)

*\*Source: Asthma in Iowa Surveillance Report (IDPH, January 2004)*



# Air Toxics & Health

- What are air toxics? Class of several hundred chemicals - 187 regulated.
- Trash burning produces benzene, styrene, formaldehyde, acrolein, dioxin and others.
- List of chronic health effects is long:  
Cancers, birth and genetic defects, impaired development of infants and children, reproductive problems, liver diseases and other serious health complications.
- Disease can take many years to develop.

# What is Dioxin?\*

- “Dioxin” is a group of chemicals including dioxin, furan and some PCBs
- Formed at low temps & oxygen-poor environment
- Formed from burning bleached paper, plastics and other products containing chlorine

*\*Source: U.S. EPA. More at [www.epa.gov/msw/backyard/health](http://www.epa.gov/msw/backyard/health)*





# The ideal dioxin source?\*

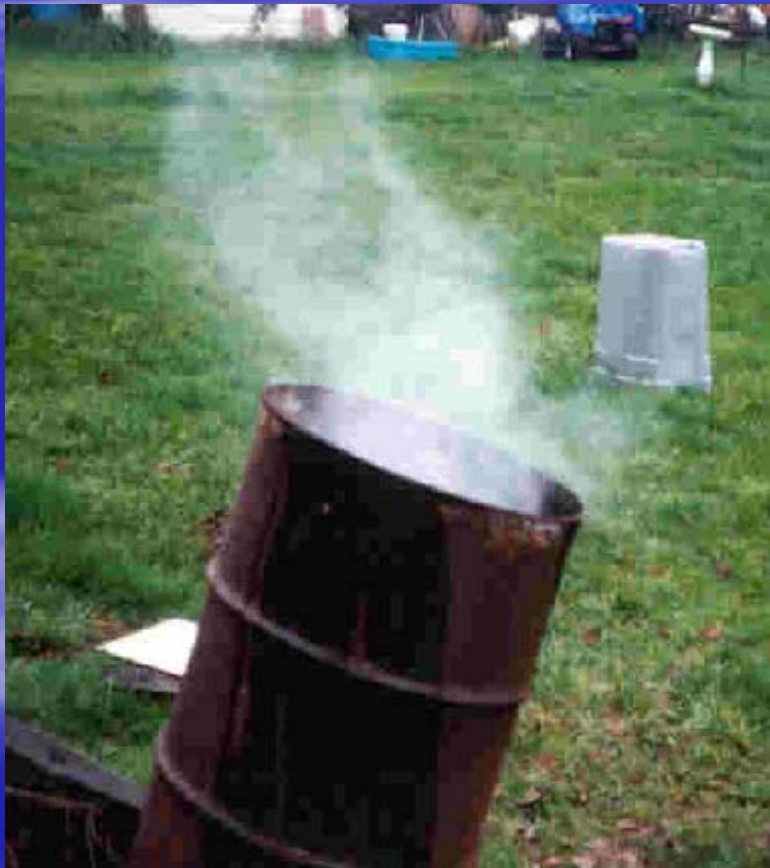
- Trash burning is the “perfect storm” for dioxin formation - low temps, low oxygen, chlorine (only a trace amount is needed), soot (PM) and metals.
- Trash burning is now the single largest source of dioxin in the country.

*\*Source: U.S. EPA. More at [www.epa.gov/msw/backyard/health](http://www.epa.gov/msw/backyard/health)*





One pound of trash  
(less than one burn  
barrel) burned  
here...



Emits as much dioxin  
as one ton of trash  
burned here:



# Why are Dioxins a problem?

- Travels great distances, even impacting remote areas.
- Shown to be highly toxic in animal studies – even at extremely low levels.
- Affects reproduction & development, suppresses the immune system, cause rashes and skin ailments, miscarriages, birth defects, and may cause cancer.

# Dioxin Concerns - con't

- Dioxin settles on plants and land, where it enters the food chain, becoming more concentrated at each step (bioaccumulation)
- People are exposed via their diet, through intake of animal fat and dairy products.

# Trash Burning and Safety

- State Fire Marshall's office tracks data
- Reviewed data on outdoor fires at single homes and duplexes.
- Report includes burning grass, rubbish and trash burning at waste dumpsters

# Trash Fire Report - Results

■ Year	Reports	Damages	Fatalities
■ 2000	241	\$11,487	0
■ 2001	360	\$1,169	1
■ 2002	481	\$48,712	0
■ 2003	402	\$4,850	2
■ 2004	360	\$2,160,	4
■ 2005	415	\$2,724	2



# What's being done?

Now that we know the health and safety concerns with trash burning, what's being done?

# Trash burning – previous ban attempt

- In 2000, DNR proposed to ban trash and leaf burning.
- Not well received, for a variety of reasons, and proposed rulemaking was terminated.
- DNR instead decided to encourage the banning of trash and leaf burning at the local level.

# Open Burning Education & Assistance

- DNR worked extensively with Iowa communities on trash and leaf burning.
  - Presented at numerous city council meetings
  - Over 50,000 DNR open burning brochures distributed
  - Radio & TV spots, DNR website & State Fair
- With assistance from DNR & other groups, many Iowa municipalities enacted their own bans on trash burning between 2000-2004.

# Trash Burning - Where are we now?

- In late 2004 - early 2005, Iowa DNR & DPH surveyed trash and leaf burning in all 948 Iowa municipalities.
- Nearly 90% response rate (n=853). ~95 cities did not complete the survey.
- At time of survey, nearly 87% of the cities responding still allowed leaf burning.
- Nearly 30% of the cities responding still allow trash burning.
- Trash burning is still common in many rural areas.

# Open Burning Survey

## Key Findings

- One of five municipalities (~20%) discussed or attempted to enact tougher burning ordinances.
- One third (~30%) of all municipalities indicated that burning was a problem in their community (e.g. citizen complaints or concerns).
- Of those municipalities with a complete ban on trash burning, ~12% indicated that they did not enforce the ban.



# Open Burning Survey

## Key Findings

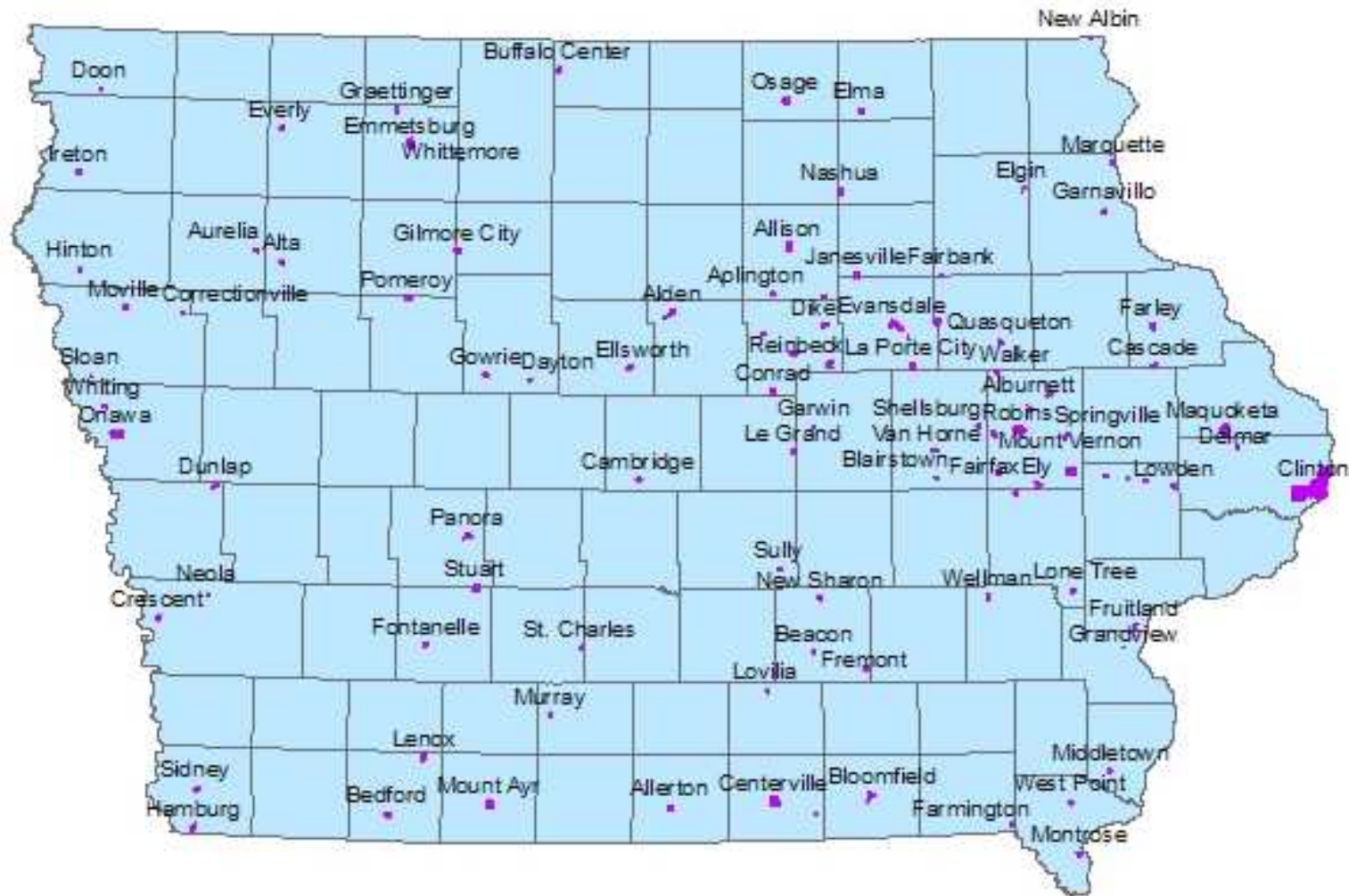
- Population range of cities with a complete ban on trash burning: 24 – 194,311
- Population range of cities that still allow trash burning: 11 – 27,319
- At the time of the survey, Clinton (pop. 27,319) still allowed burning of residential mail/office paper.
- Without including Clinton, the population range of cities that still allow burning: 11 – 6,048

# **Trash Burning Survey – A Graphic View**

# Cities surveyed with population > 1000 that Allow Burning (~ 37 cities)



that Allow Burning (~85 cities)

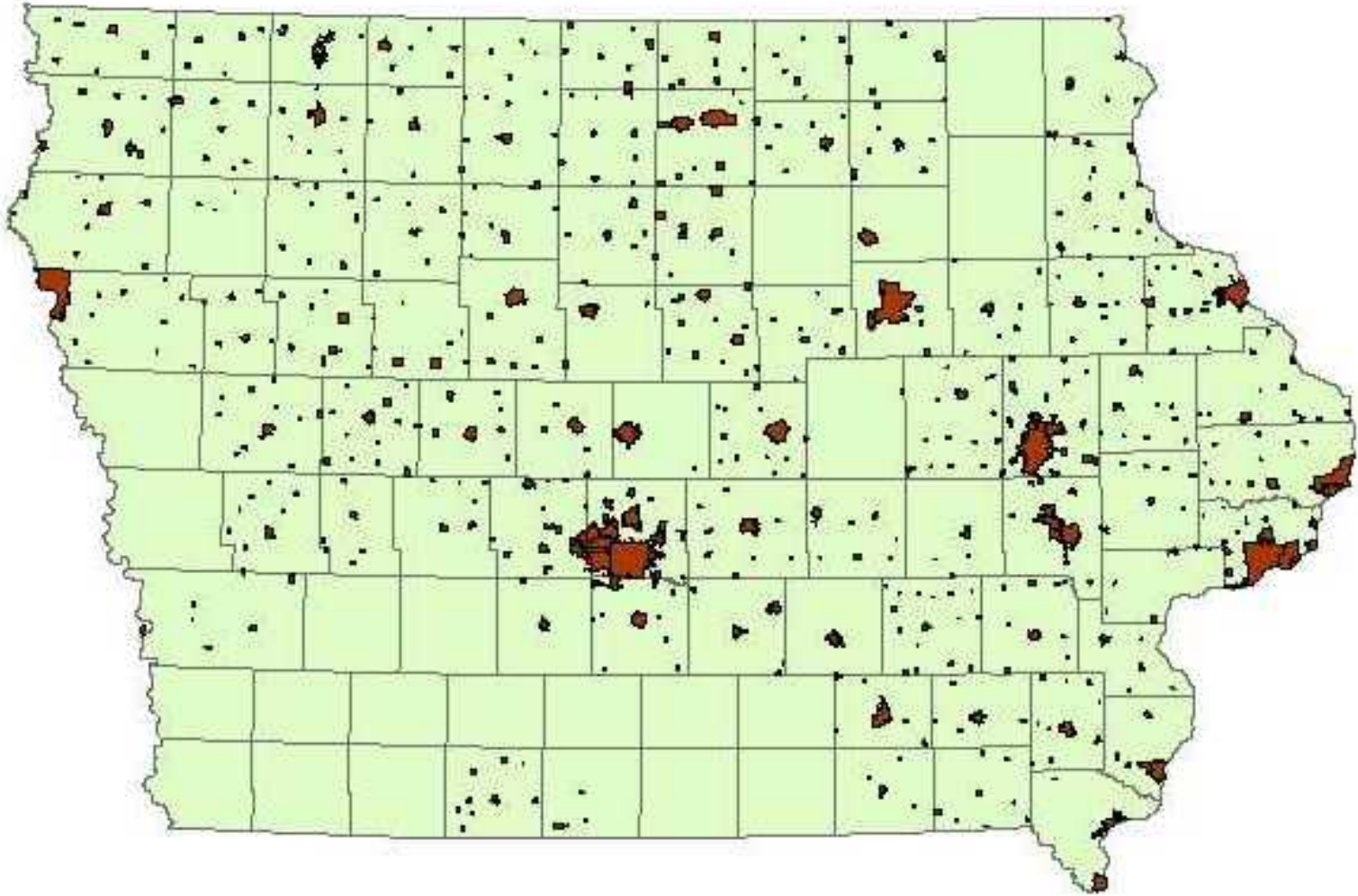


# **Curbside Recycling**

**(from DNR Comprehensive  
Planning data)**



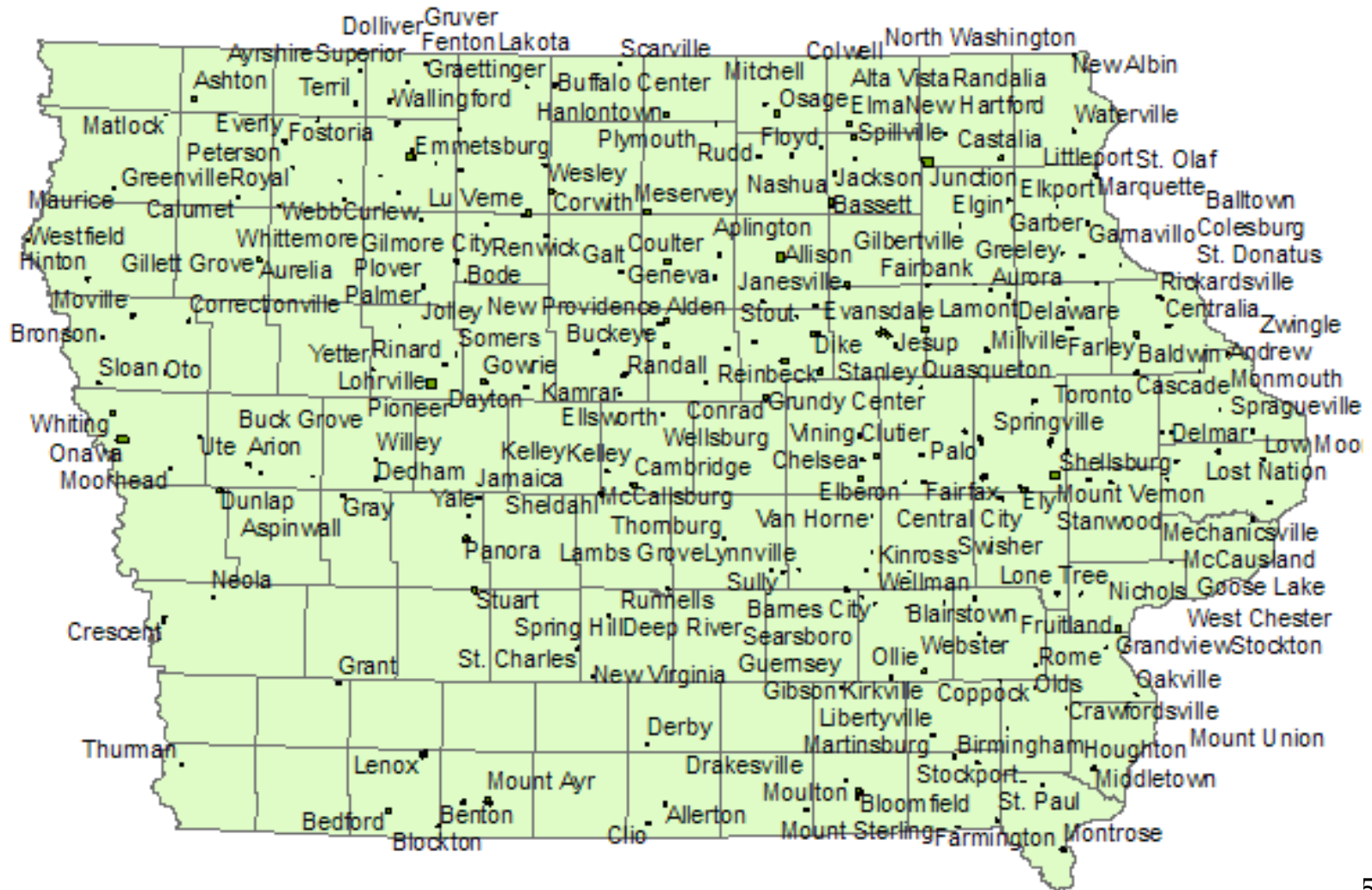
# Cities with Curbside Recycling



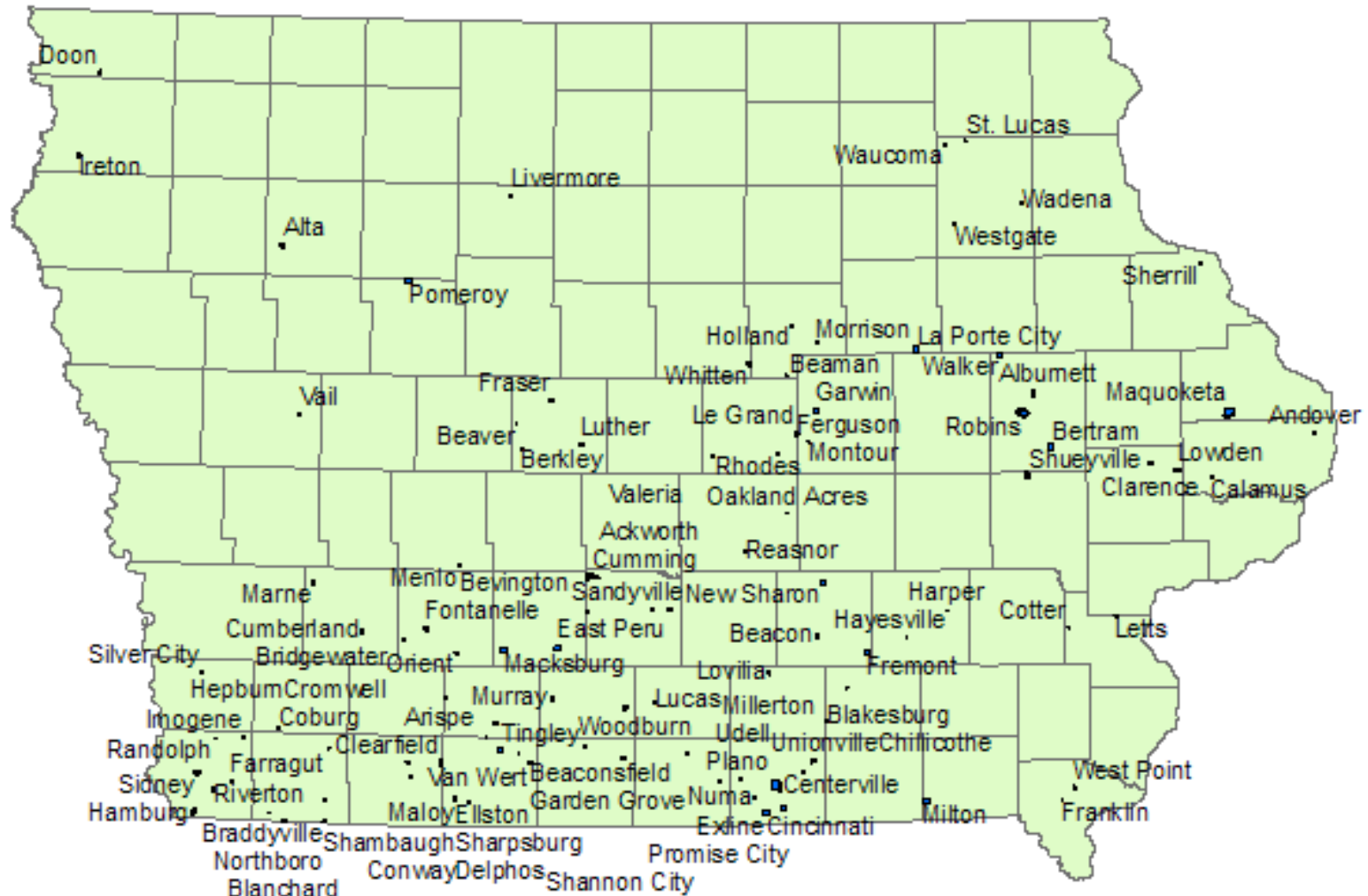
# **Trash burning, trash disposal, and recycling**

**(from survey and comp planning data)**

# Cities that have contracts with trash haulers that allow trash burning

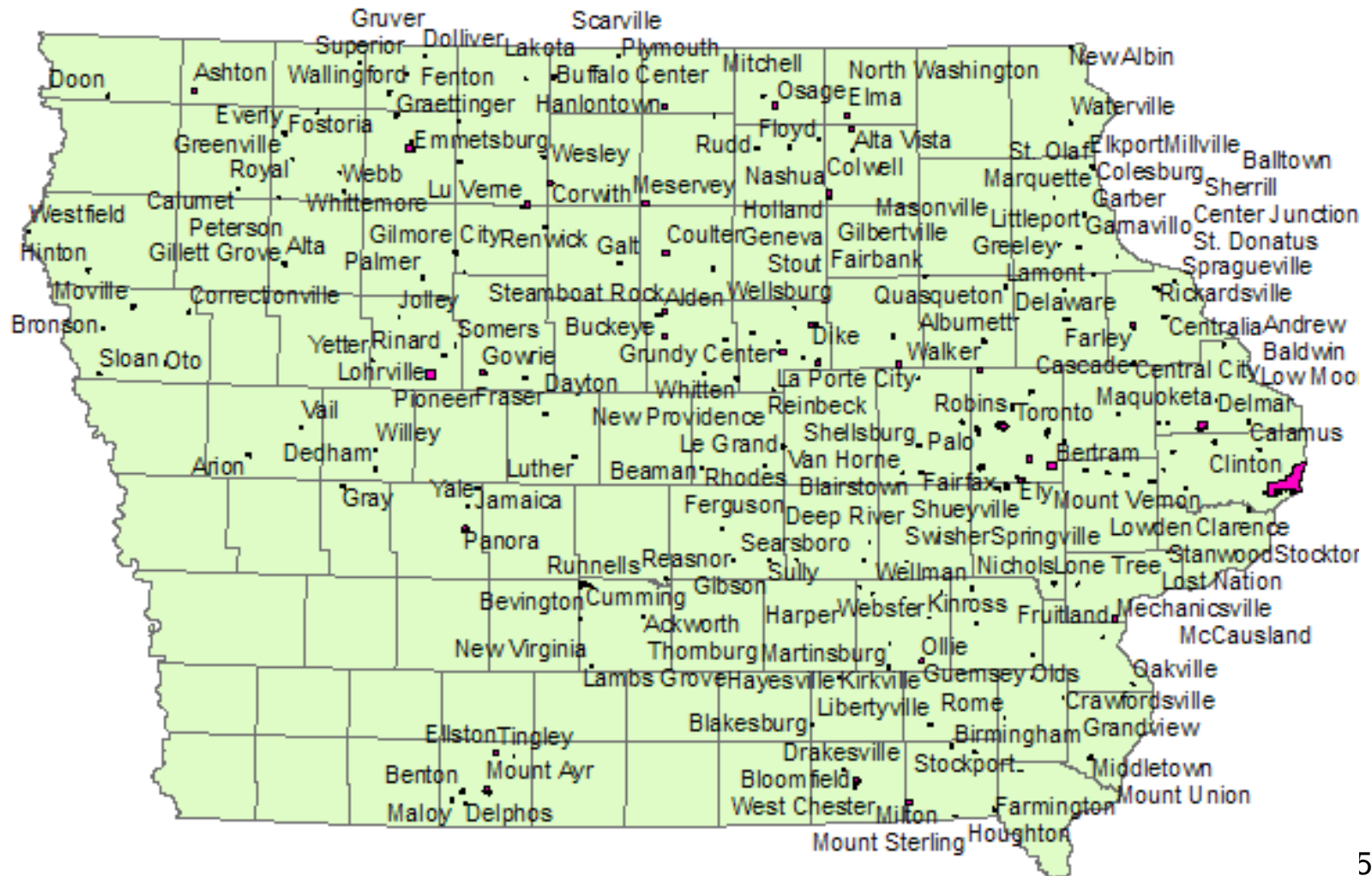


Cities that may not have trash hauler contracts (pop. <10,000) that allow trash burning



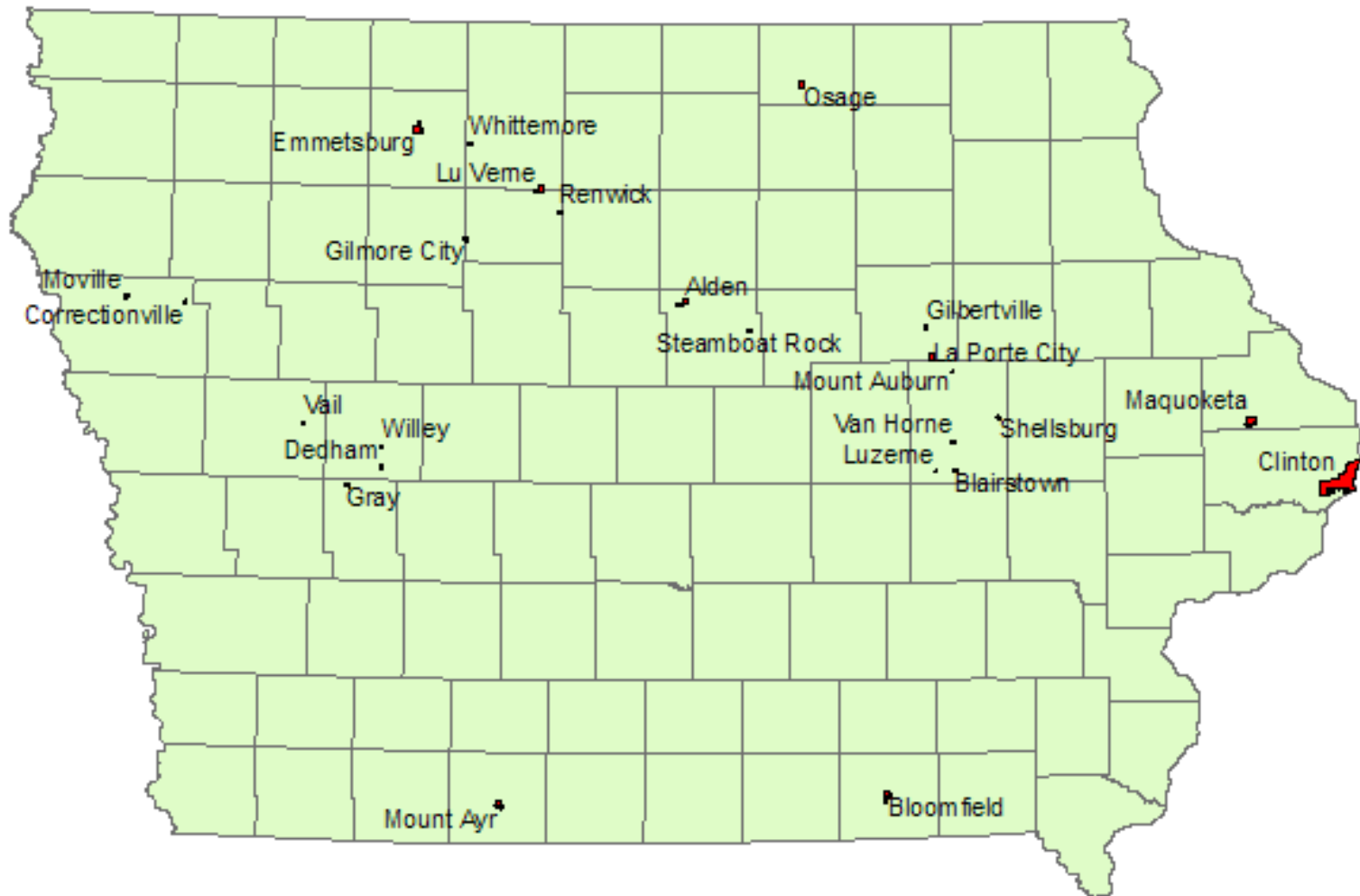


# Cities with curbside recycling that allow trash burning

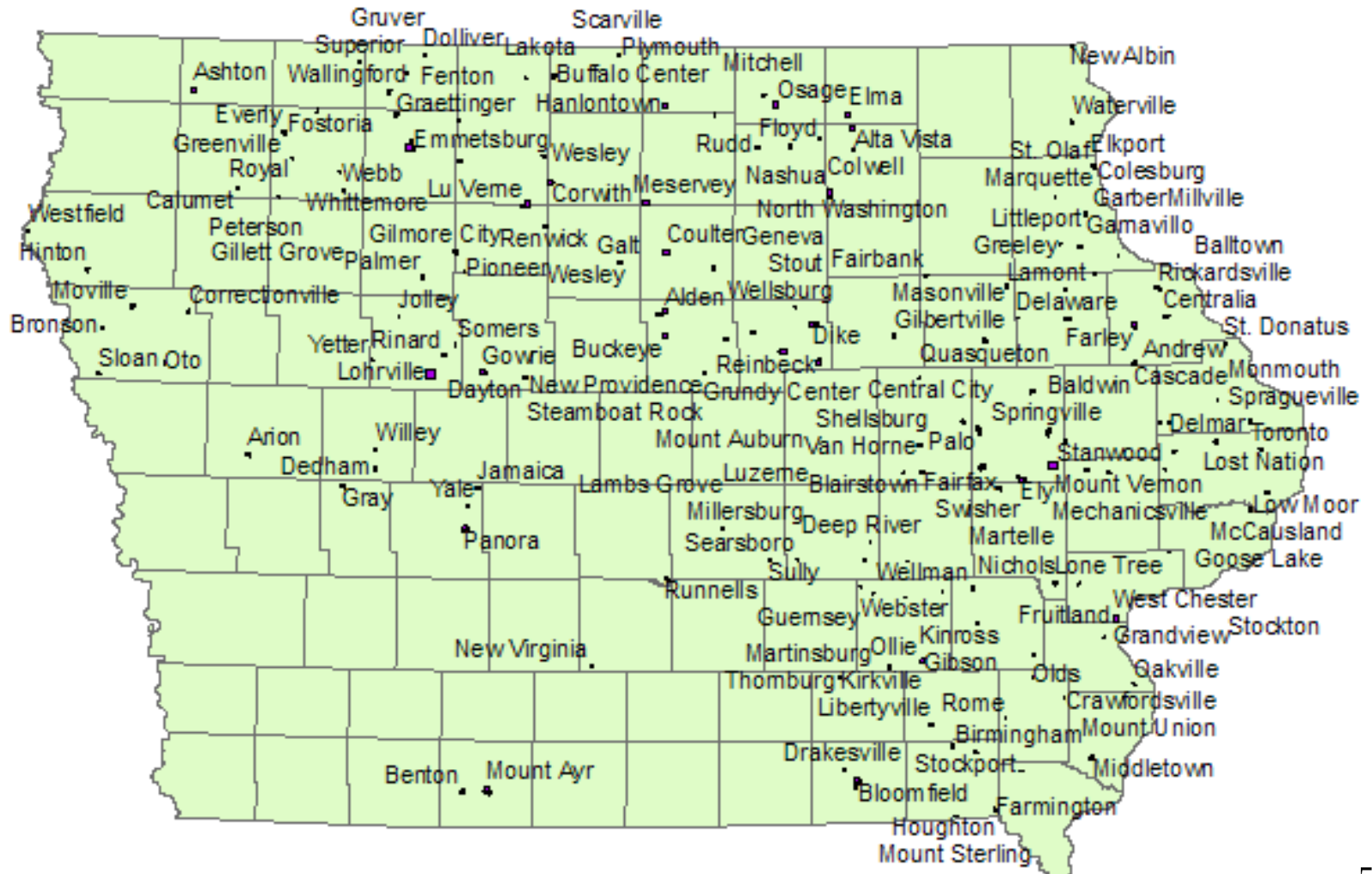




# Cities with curbside & drop off recycling that allow trash burning



# Cities with curbside recycling and trash hauler contracts that allow trash burning



# Thank You

- Q&A, discussion.
- **Contact Information:**

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